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### List of Abbreviations and Symbols

<table>
<thead>
<tr>
<th><strong>Main Respiratory Terms</strong></th>
<th><strong>Modifiers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AHR</td>
<td>( a ) arterial</td>
</tr>
<tr>
<td>( B_k )</td>
<td>( C ) central loop related</td>
</tr>
<tr>
<td>( CO_2 )</td>
<td>( e ) expired</td>
</tr>
<tr>
<td>( F )</td>
<td>( ET ) end-tidal</td>
</tr>
<tr>
<td>( G )</td>
<td>( i ) inspired</td>
</tr>
<tr>
<td>HVD</td>
<td>( n ) parallel noise</td>
</tr>
<tr>
<td>( O_2 )</td>
<td>( P ) peripheral loop related</td>
</tr>
<tr>
<td>( P )</td>
<td>( T ) total</td>
</tr>
<tr>
<td>( RR )</td>
<td>respiratory rate</td>
</tr>
<tr>
<td>( S )</td>
<td>ventilatory ( CO_2 ) sensitivity</td>
</tr>
<tr>
<td>( S_{pO_2} )</td>
<td>oxygen saturation</td>
</tr>
<tr>
<td>( T )</td>
<td>time delay</td>
</tr>
<tr>
<td>( \tau )</td>
<td>time constant</td>
</tr>
<tr>
<td>( \dot{V}_i )</td>
<td>inspired minute ventilation</td>
</tr>
<tr>
<td>( V_T )</td>
<td>tidal volume</td>
</tr>
<tr>
<td>( W )</td>
<td>measurement noise</td>
</tr>
</tbody>
</table>

#### Modeling Terms of Chapters 6 and 7

<table>
<thead>
<tr>
<th><strong>Dimensionless Units</strong></th>
<th><strong>Physical Meaning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC</td>
<td>Akaike's information criterion</td>
</tr>
<tr>
<td>( C_{25} )</td>
<td>concentration causing 25% effect</td>
</tr>
<tr>
<td>( C_{50} )</td>
<td>concentration causing 50% effect</td>
</tr>
<tr>
<td>( E )</td>
<td>effect</td>
</tr>
<tr>
<td>( E_0 )</td>
<td>baseline effect</td>
</tr>
<tr>
<td>( \gamma )</td>
<td>shape parameter</td>
</tr>
<tr>
<td>( \lambda )</td>
<td>scaling parameter</td>
</tr>
</tbody>
</table>

#### Miscellaneous Terms

<table>
<thead>
<tr>
<th><strong>Term</strong></th>
<th><strong>Physical Meaning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AOX</td>
<td>antioxidant</td>
</tr>
<tr>
<td>BIS</td>
<td>bispectral index</td>
</tr>
<tr>
<td>CBF</td>
<td>cerebral blood flow</td>
</tr>
<tr>
<td>CBR</td>
<td>carotid body resection</td>
</tr>
<tr>
<td>DEF</td>
<td>dynamic end-tidal forcing</td>
</tr>
<tr>
<td>EEG</td>
<td>electroencephalogram</td>
</tr>
<tr>
<td>GABA</td>
<td>( \gamma ) amino butyric acid</td>
</tr>
<tr>
<td>HR</td>
<td>heart rate</td>
</tr>
<tr>
<td>MAP</td>
<td>mean arterial pressure</td>
</tr>
<tr>
<td>MFBS</td>
<td>multifrequency binary sequence</td>
</tr>
<tr>
<td>OR</td>
<td>opioid receptor</td>
</tr>
<tr>
<td>ROS</td>
<td>reactive oxygen species</td>
</tr>
</tbody>
</table>
Curriculum Vitae

Diederik Jan Friso Nieuwenhuijs was born on Februari 8, 1972 in Utrecht, The Netherlands. He obtained his Atheneum diploma at the Sint Bonifatius college in Utrecht in July 1990. In September 1990 he entered medical school at the Vrije Universiteit in Amsterdam and received his medical degree in June 1998. From June to October 1998 he worked as a resident at the Intensive Care Unit at the Elisabeth Gasthuis in Eindhoven. In October 1998, he was appointed as graduate student, supported by Grant MW 902-19-144 from The Netherlands Organization for Pure Research (ZorgOnderzoek Nederland Medische Wetenschappen-NWO), at the Department of Anesthesiology, Leiden University Medical Center, and started the investigations described in this thesis. In October 2002, he will start his residency in anesthesiology at the Department of Anesthesiology at the Leiden University Medical Center (Chairman: Prof. Dr. J.W. van Kleef).

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